likely communication mechanism would be infrared light emitting diodes (LEDs). An array of LED sensors and emitters could be installed across the store ceiling to ensure each tag is accessible.

Price changes entered into the central computer can be automatically distributed to the store floor either off-hours or along with a store wide announcement of a price change. Update information is sent to the portable electronic price tag and the unit responds to let the system know the shelf has actually been updated. With the portable electronic price tag, this pricing control can now be done on products standing on the stores floor and on shelves not wired for computer power and digital data communications.

Dwg.0/0

Title Terms: ELECTRONIC; PRICE; TAG; WIRELESS; COMMUNICATE; CONTROL; COMPUTER; LCD; FORCE; PLATE; MICRO; CHIP; CIRCUIT; DISPLAY; PRICE; DESCRIBE; PRODUCT; POWER; MANAGEMENT; SCHEME; WIRE; BIDIRECTIONAL; COMMUNICATE; CONTROL; COMPUTER

Derwent Class: T05

International Patent Class (Main): G07G-000/00

File Segment: EPI

Manual Codes (EPI/S-X): T05-L01X

5/9/17

DIALOG(R)File 351:Derwent WPI

009041901 **Image available**

WPI Acc No: 1992-169263 /199221

XRPX Acc No: N92-127589

Electronic price label display system - has electronic display mounted on holder carrying electronic module operated via radio, infrared or inductive loop

Patent Assignee: SAINSBURY PLC J (SAIS)

Inventor: CROMPTON S H

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
GB 2249854	A	19920520	GB 9022600	A	19901017	199221 B

Priority Applications (No Type Date): GB 9022600 A 19901017

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
GB 2249854	A		32	G09F-003/18	

Abstract (Basic): GB 2249854 A

The holder (3) has a rubber pad (15) mounted on the lower edge of the holder and longitudinally extending ribs (14) on an upper edge of the holder which engage within an edge strip (16) of the retain product display. The holder may only be removed from the edge strip using a special tool (19) which is used to lever out the holder from the edge strip.

The holder carries an electronic label (1) and an electronic

module operative through radio, infrared or inductive loop. A central controller may be linked to further store computers and linked to a host computer at head office.

USE/ADVANTAGE - Esp. in supermarket. Reliable and simple way of entering information. Allows updating of displayed information by central controller without use of handset.

Dwg.5/11

Title Terms: ELECTRONIC; PRICE; LABEL; DISPLAY; SYSTEM; ELECTRONIC; DISPLAY ; MOUNT; HOLD; CARRY; ELECTRONIC; MODULE; OPERATE; RADIO; INFRARED; INDUCTIVE; LOOP

Derwent Class: P85; T05

International Patent Class (Main): G09F-003/18

International Patent Class (Additional): G06F-015/21

File Segment: EPI; EngPI

Manual Codes (EPI/S-X): T05-L01D; T05-L01X

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(12) UK Patent Application (19) GB (11) 2 249 854 (13) A

(43) Date of A publication 20.05.1992

(21) Application No 9022600.2

(22) Date of filing 17.10.1990

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(51) INT CL[5]
G09F 3/18, G06F 15/21

(52) UK CL (Edition K)
G5C CES
G4H HNP H1A H13D H14A H14D H14G H60
U1S S1727

(56) Documents cited
GB 2183884 A
US 4583309 A
GB 2072398 A
US 4282667 A
WO 86/07176 A
US 4184277 A

(58) Field of search
UK CL (Edition K) G5C CBG CBL CEQ CER CES CFA
INT CL[5] G09F

(54) Electronic labels

(57) A holder 3 for mounting an electronic display on to a retail product display has engaging means in the form of a rubber pad 15 mounted on the lower edge of the holder and longitudinally extending ribs 14 on an upper edge of the holder which engage within an edge strip 16 of the retail product display. The holder 3 may only be removed from the edge strip 16 by means of a special tool 19 which is used to lever out the holder from the edge strip. The holder carries an electronic label (1) and an electronic module (2) operative through radio, infrared or inductive loop. A central controller (100) may be linked to further store computers and linked to a host computer at head office.

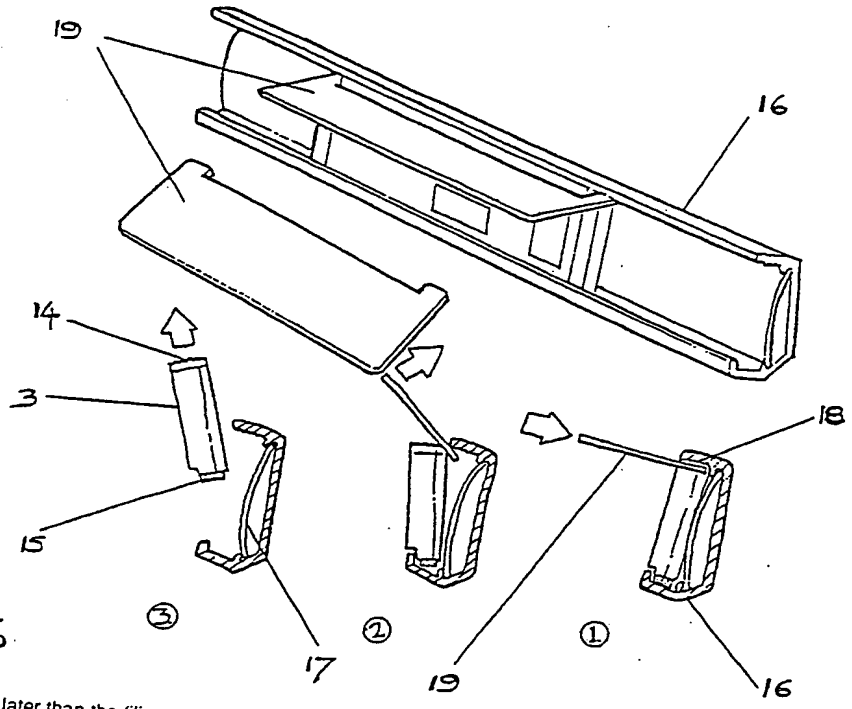
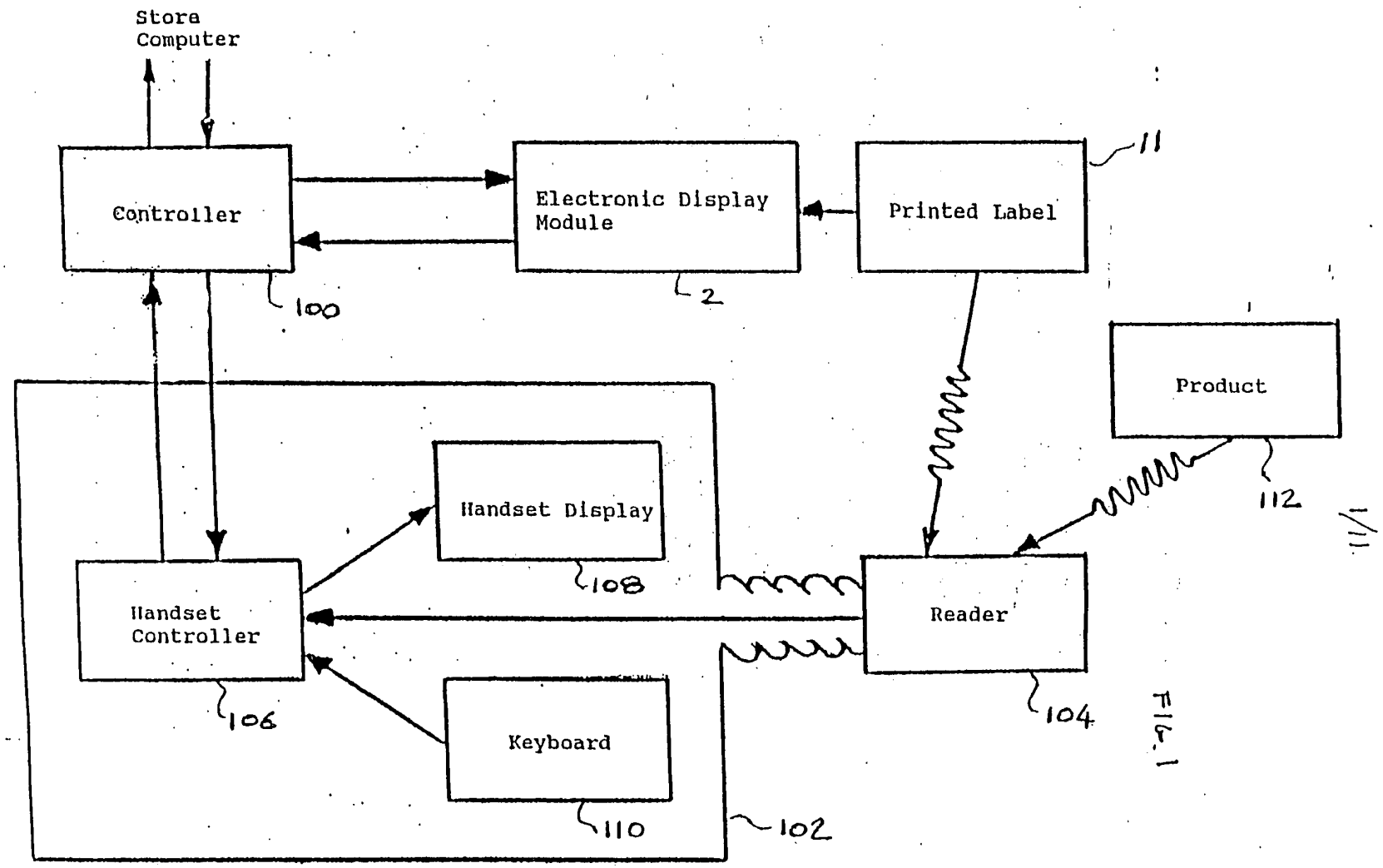


Fig. 5

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.
At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

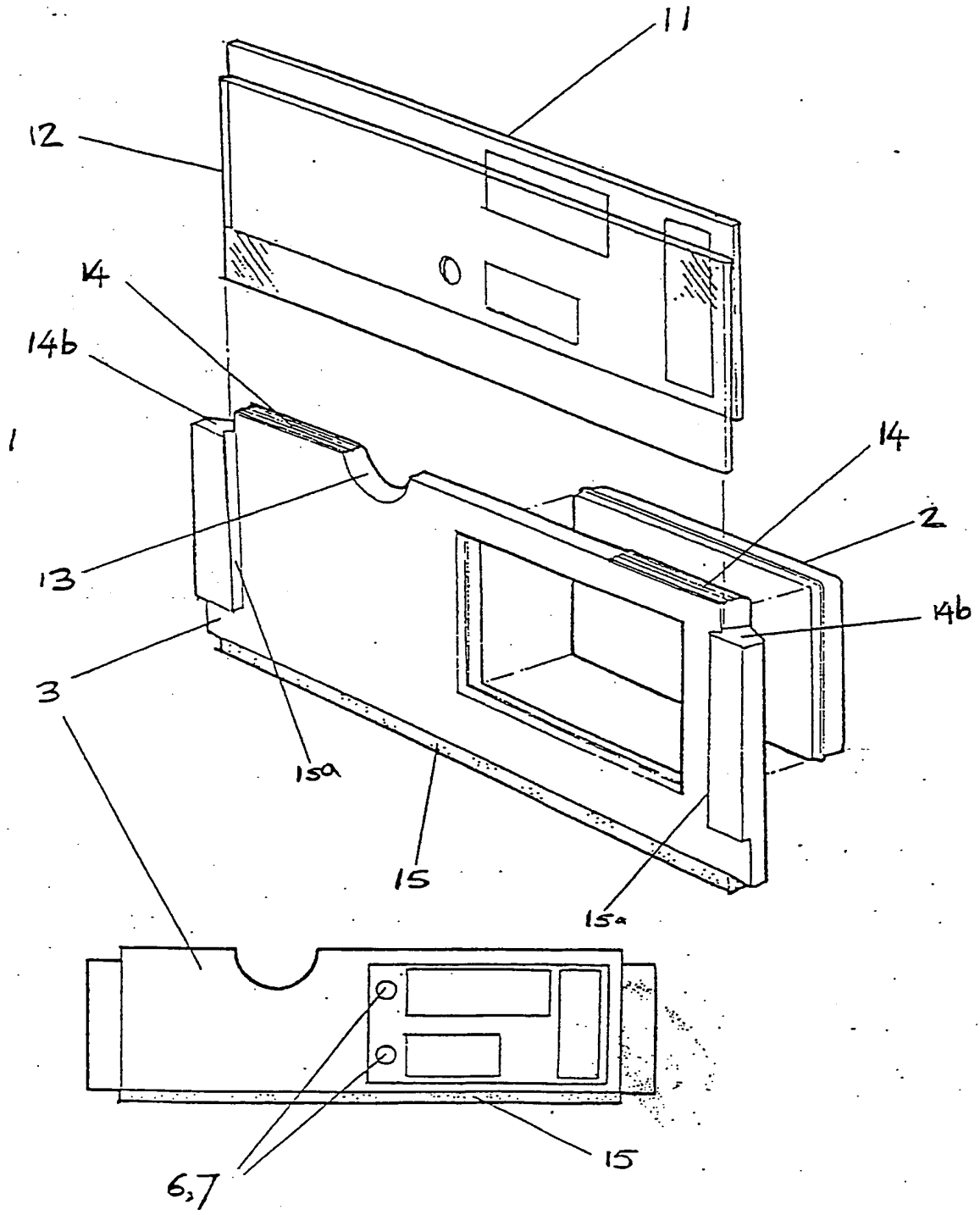
GB 2 249 854 A


Store Computer
Controller
100
Electronic Display Module
2
Printed Label
11
Product
112
Handset Display
108
Handset Controller
106
Reader
104
Keyboard
110
102

1/1

Fig. 1

Fig. 2



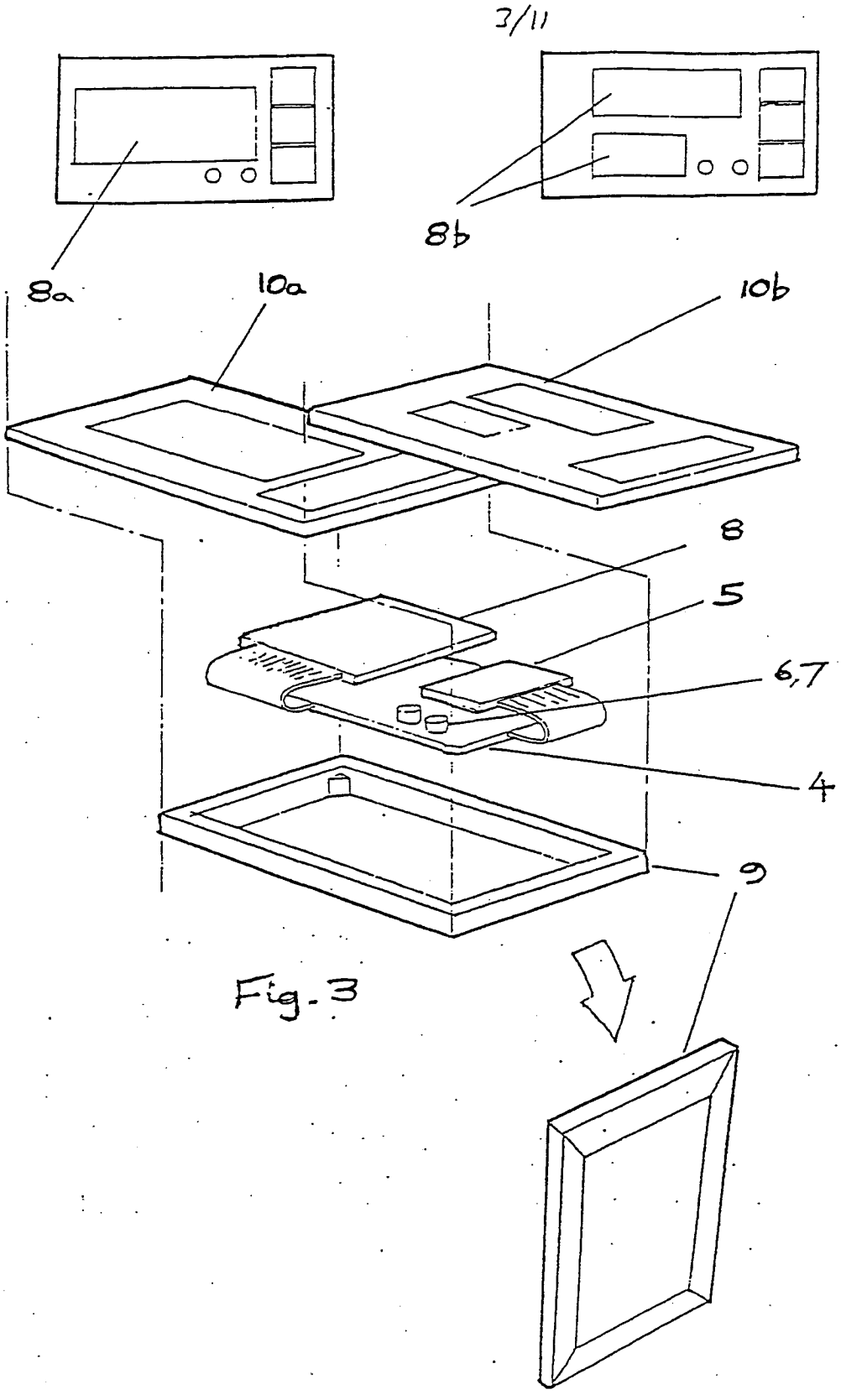
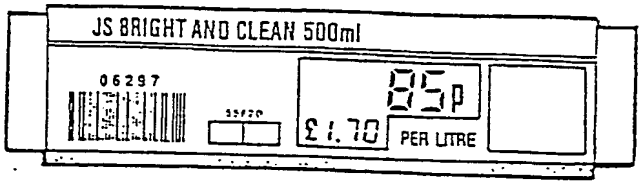
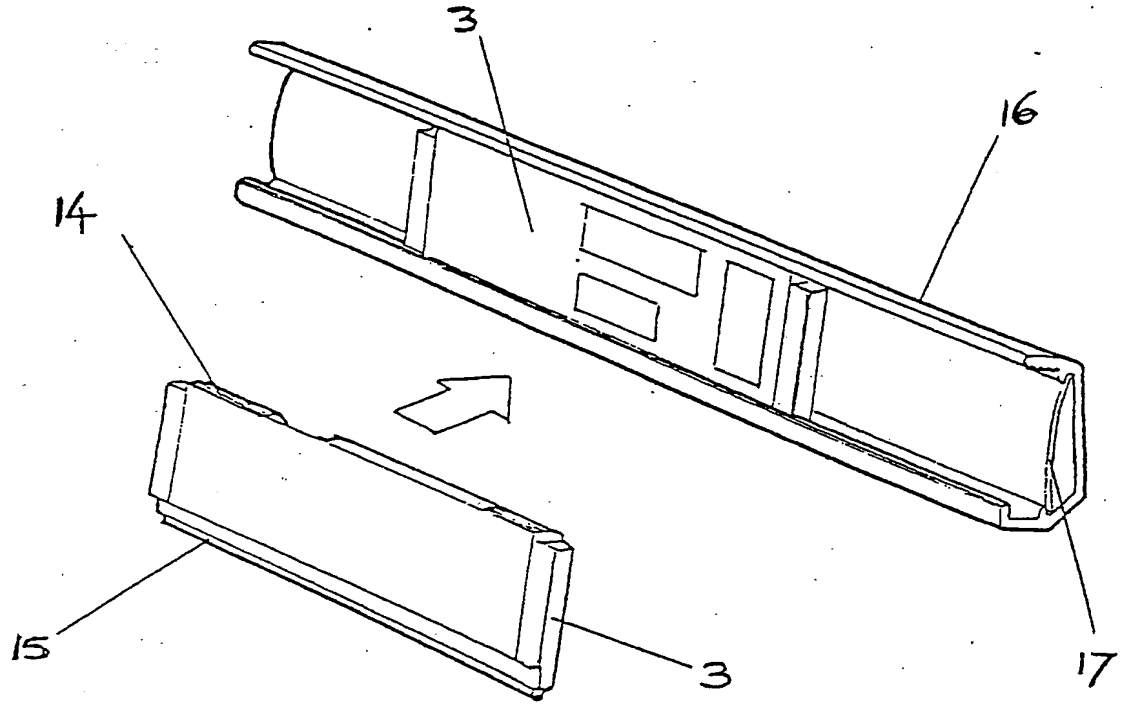


Fig. 3

Fig.4


JS BRIGHT AND CLEAN 500ml
06297
85p
£1.70
PER LITRE


3
16
14
15
3
17

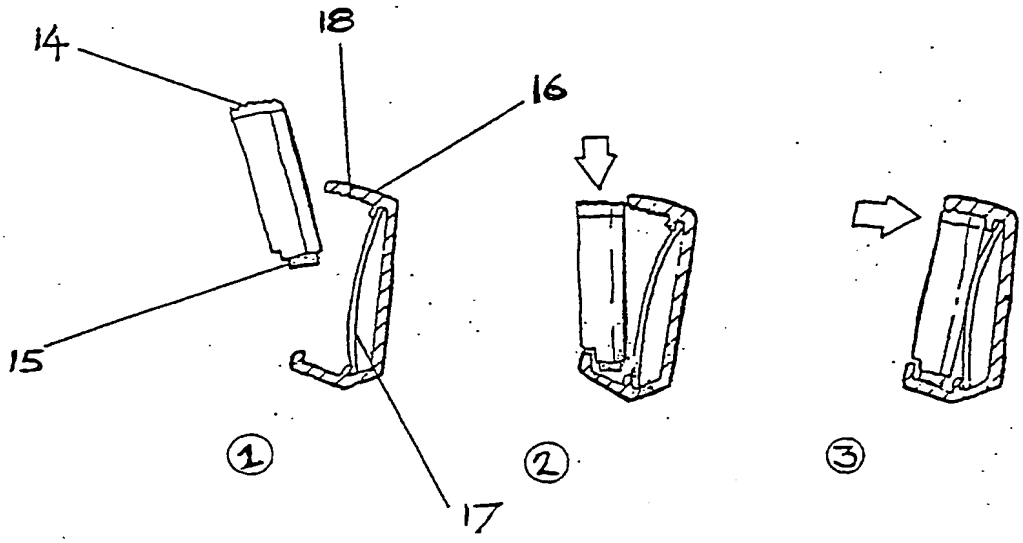

14
18
16
15
17
①
②
③

Fig. 5

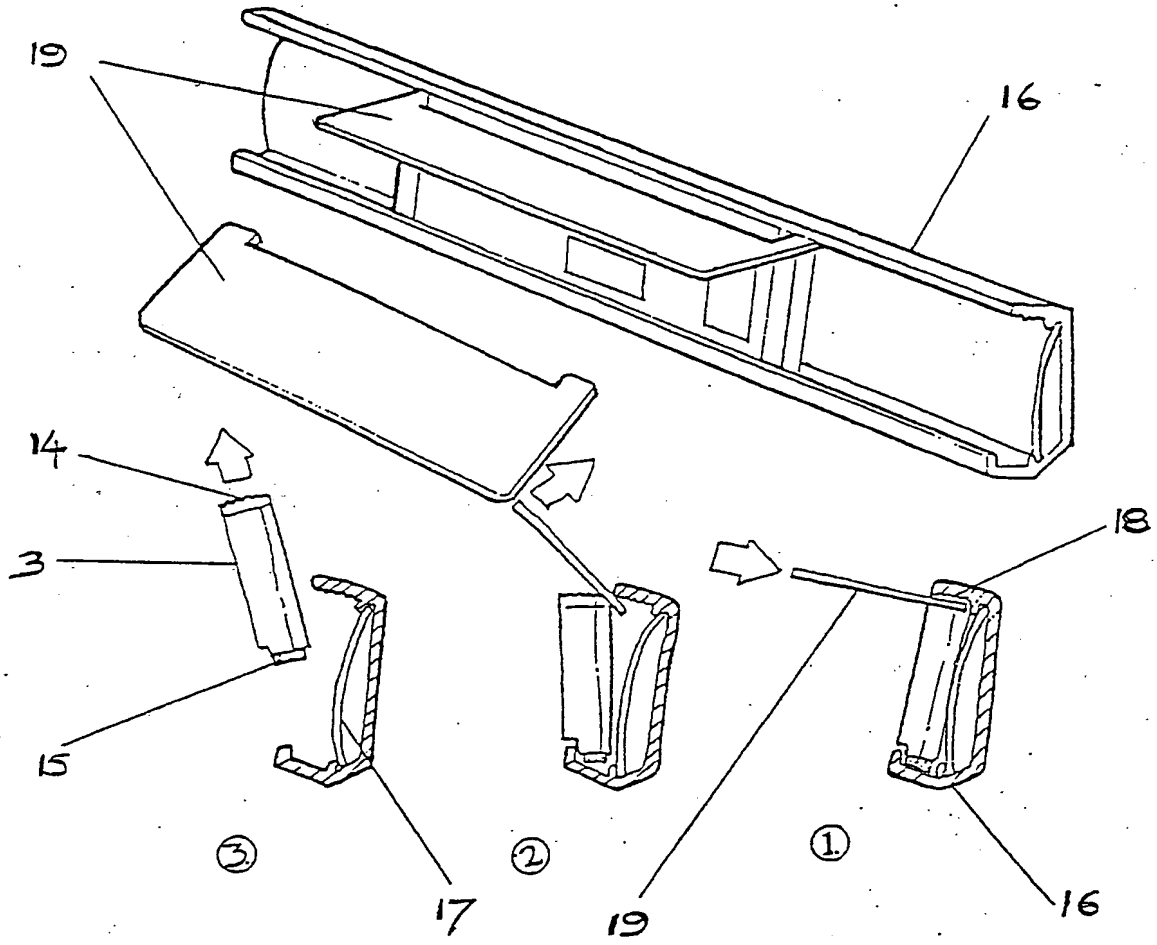
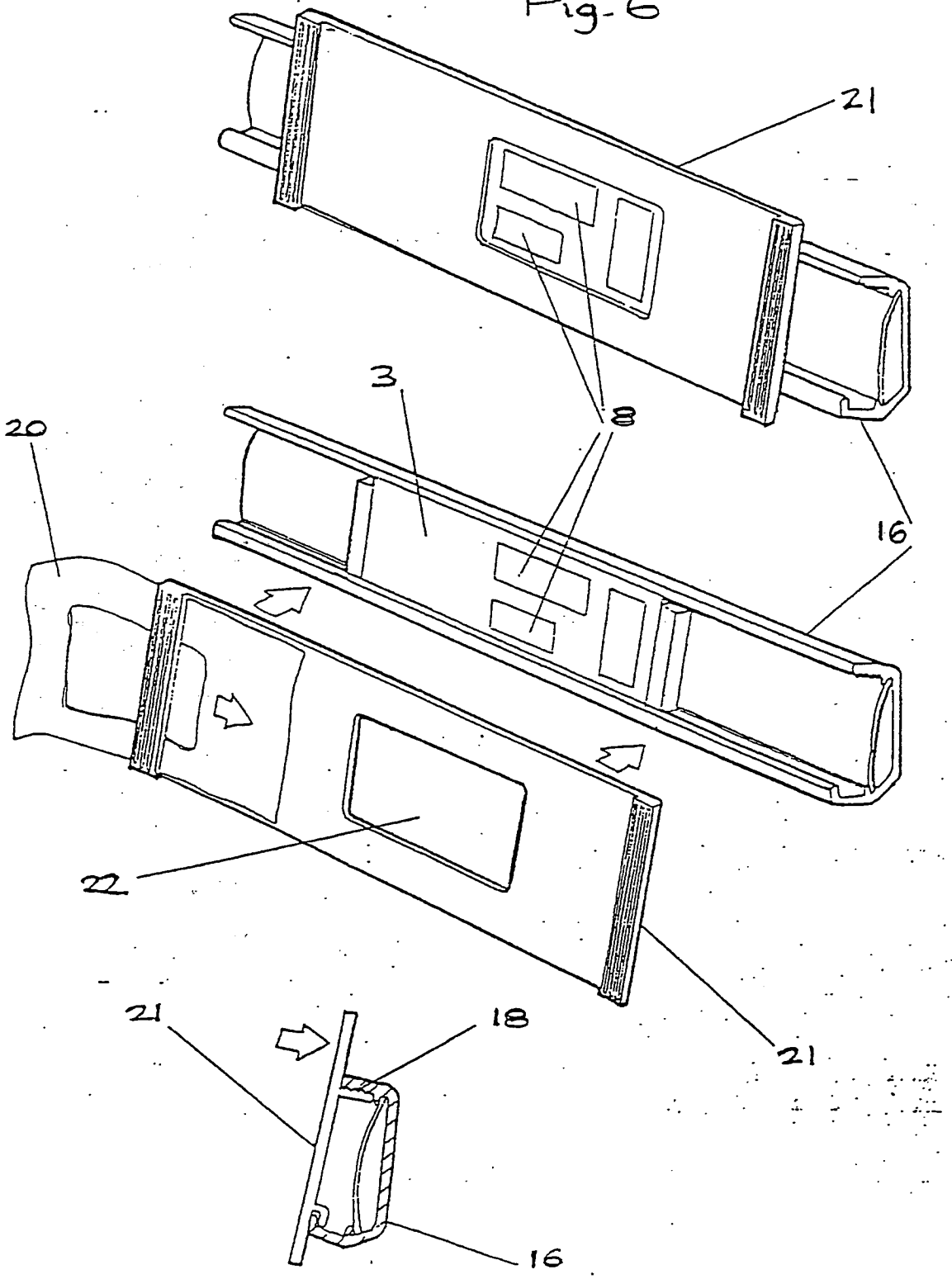


Fig. 6



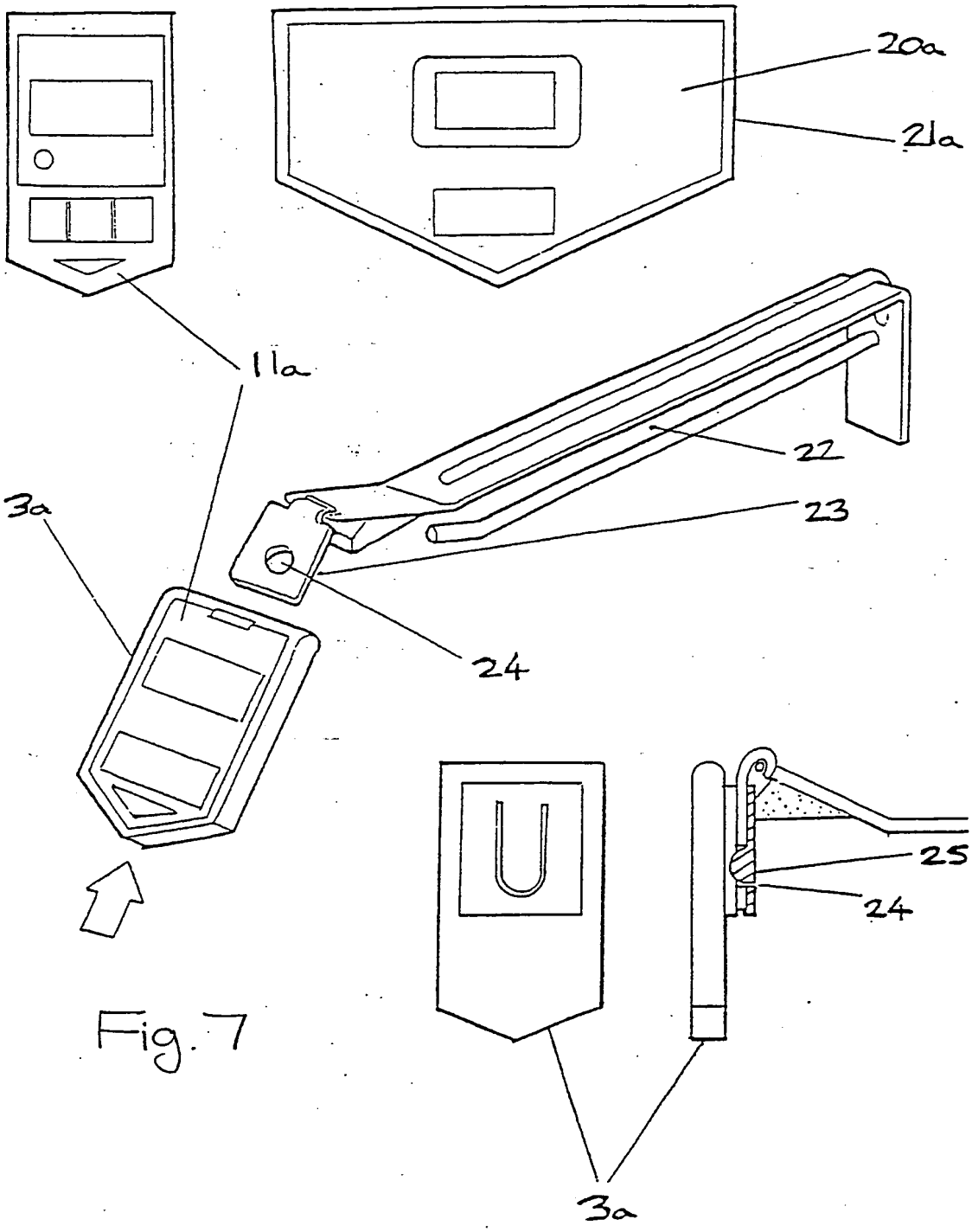
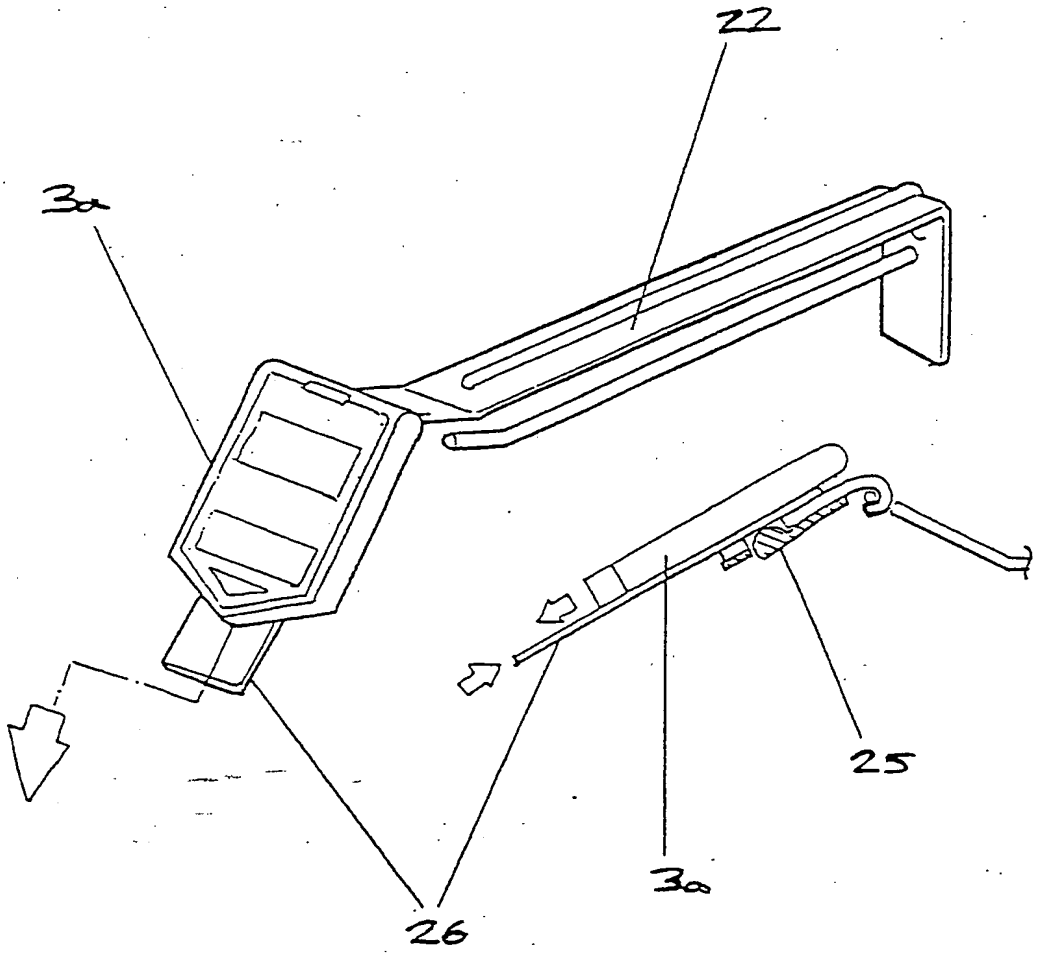


Fig. 7

Fig. 8



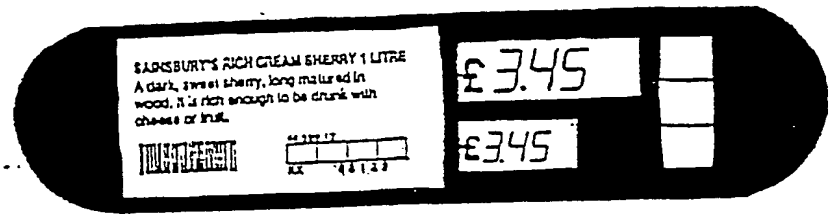
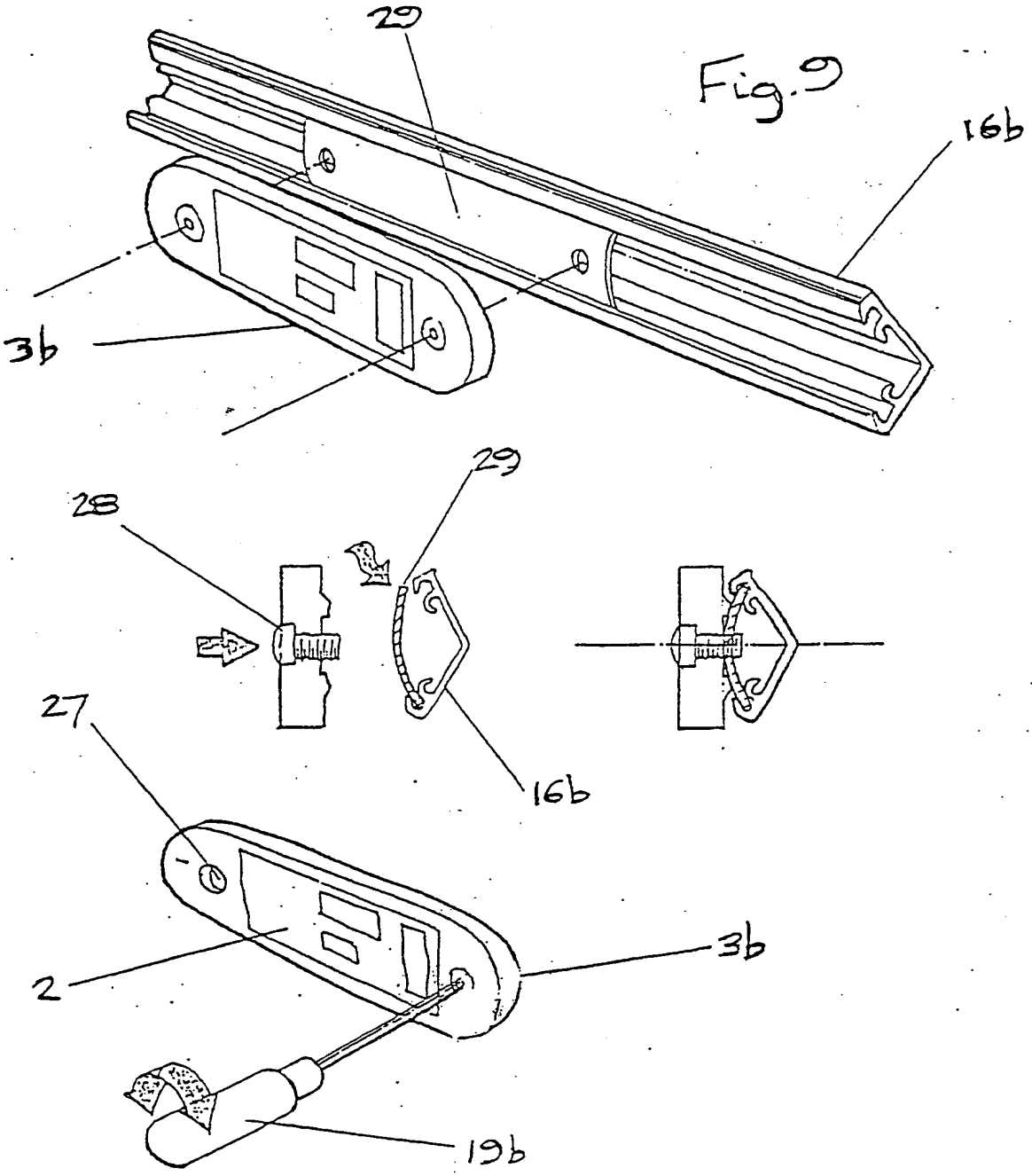

SAINSBURY'S RICH CREAM SHERRY 1 LITRE
A dark, sweet sherry, long matured in wood. It is rich enough to be drunk with cheese or fruit.
£3.45
£3.45

Fig. 9


29
16b
3b
28
29
16b
27
2
3b
19b

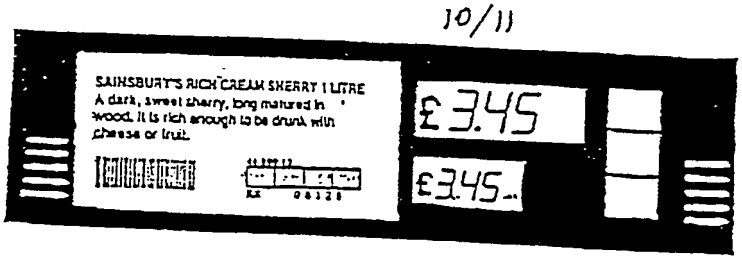
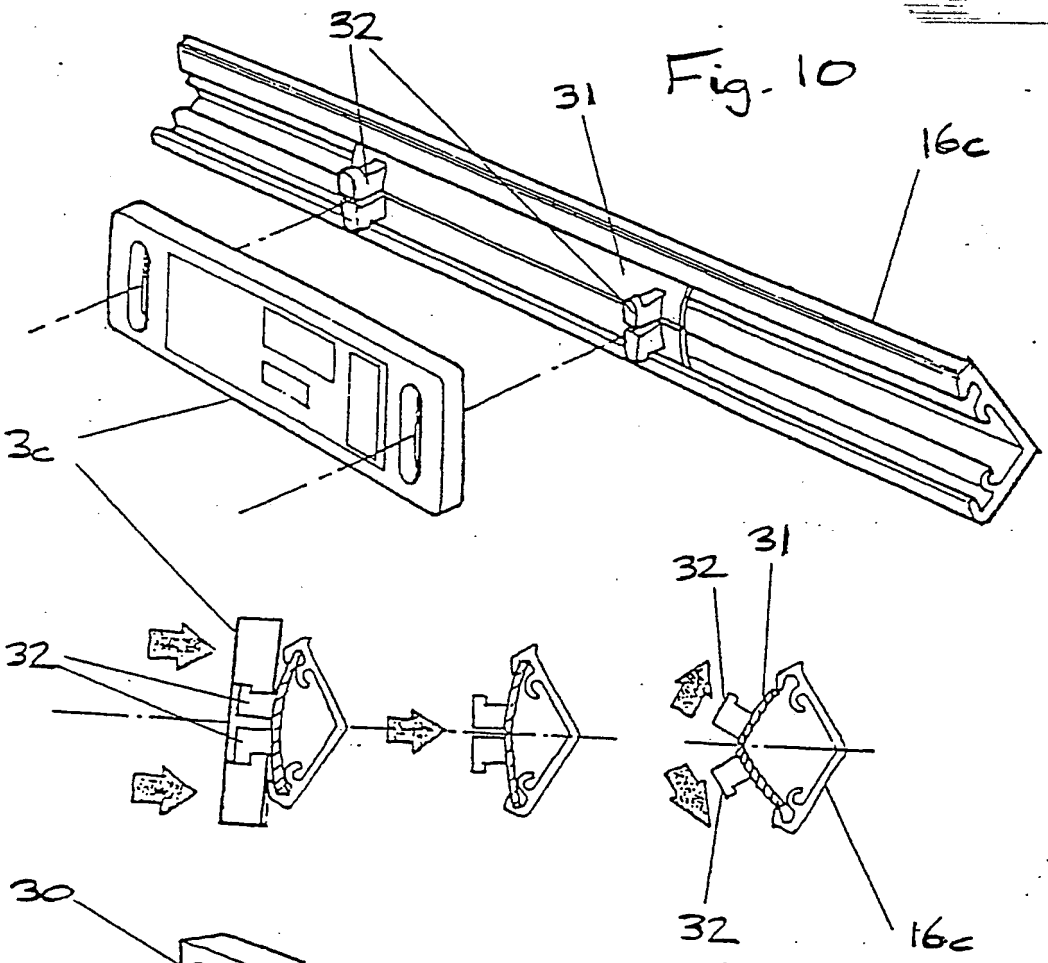

SAINSBURY'S RICH CREAM SHERRY 1 LITRE
A dark, sweet sherry, long matured in wood. It is rich enough to be drunk with cheese or fruit.
£3.45
£3.45

Fig. 10


32
31
16c
3c
32
31
32
32
16c
30
2
3c
19c

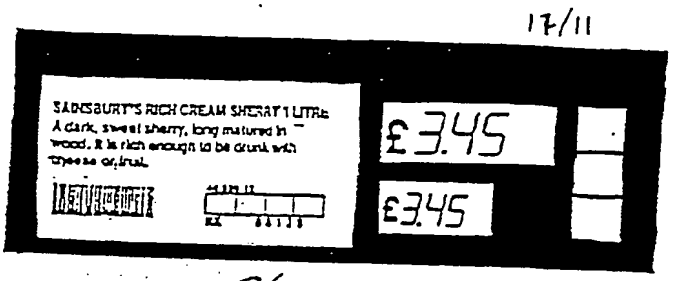
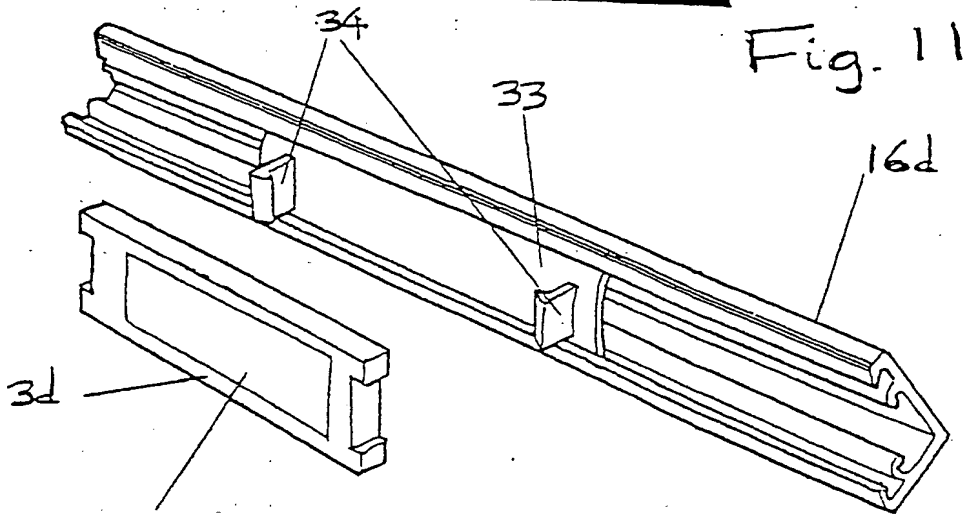
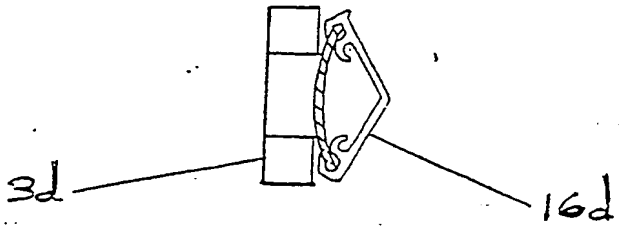
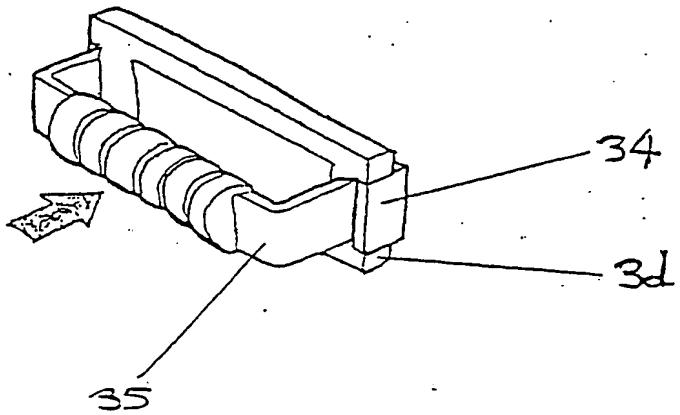

SAINSBURY'S RICH CREAM SHERRY 1 LITRE
A dark, sweet sherry, long matured in wood. It is rich enough to be drunk with cheese or fruit.
£3.45
£3.45

Fig. 11


34
33
16d
3d


3d
16d


34
3d
35

ELECTRONIC LABELS

The present invention relates to an electronic price label system, particularly for use in retail stores, and more particularly to an apparatus which comprises a network of electronic labels for displaying product information, the labels being controlled and updated by a central controller.

Various centrally controlled electronic product labelling networks have been proposed. For instance, as described in US 4139149, US 4082886 and in the Epsi' Lanne system, a hard-wired network is provided in which a central controller addresses price display units and updates or changes their display according to changes of the product to which they refer. A similar system using an infra-red link is also known. Other proposals such as Price Link system and the Hugin Sweda system have a number of displays linked, by hard wiring or radio to a common transceiver which in turn communicates e.g. by radio transmission, to a central control system. A system has also been proposed in GB 2197564 in which a central controller communicates with each display unit. These display units are capable of receiving price information and also transmitting to the controller an acknowledgement of error free reception.

These labelling systems have limitations and there is a need for an apparatus which is easier to install and possesses greater flexibility.

A first aspect of the present invention provides a display module for displaying retail product information comprising an electronic display which is suitable for mounting in two or more different holders.

The display module may comprise a sealed housing with at least one transparent window through which the display may be received and such a module is simple and robust, since has no opening in its casing. Further, it reduces the expense of the system since it may be fitted in any one of a number of holders such as those suitable for shelf edges, display hooks or delicatessen counters.

A second aspect of the invention provides an electronic label for displaying retail product information comprising an electronic display and one or more sensors for detecting the presence of one or more printed labels mountable on said electronic label.

The printed labels may carry information on the product, such as the product name and origin and a description.

Two sensors may be provided, one for the information label and one to detect the presence of an additional printed label used for promotional purposes.

The sensors may be light sensors so positioned as to be obscured when a label is fitted.

A third aspect of the invention provides an electronic label system comprising a central controller

which is remotely connected by a two-way communications link to at least one electronic label.

This allows the electronic labels send status information to the controller such as information regarding the presence of printed labels as mentioned in connection with the second aspect. The link may be by infra-red, radio or inductive loop transmission.

A fourth aspect of the invention provides a holder for mounting an electronic label for displaying product information on a channel section shelf-edge strip, the holder comprising a resilient material on one edge and one or more ribs formed on an opposite edge of said holder, wherein to mount said holder, the edge of the holder carrying said resilient material is located on one wall of the channel of said shelf edge strip and the other edge is positioned with said one or more ribs interlocked with one or more corresponding grooves provided on the opposite wall of the channel.

This holder provides a secure means of mounting the electronic display because friction between the resilient material and the channel wall prevents any lateral sliding of the label/holder and the interlocking of the ribs and grooves prevent removal of the holder without a special tool.

The grooves and resilient material may extend over part or all of the length of the holder and the ribs may

extend along the edge of the holder in parallel, closely-spaced relation.

A fifth aspect of the invention provides an electronic label system comprising at least one electronic label for displaying product information, at least one handset for scanning and electronically reading printed product information codes and a central controller remote from said electronic label and said handset and which is provided with a two way communication link with said electronic label and said handset.

The communications links may be, for instance, by infra-red, radio or inductive loop and the handset may include a senor, e.g. a bar code reader, to allow it to read the bar code on the product and also a bar code on a product information display label (if provided) to indicate to the controller what product the label is to refer to. It may also include a display to display information on the product and also a key-pad to allow entry of information, e.g. for verification or check routines on set-up of a label. The handset can also be used for sending restocking and/or ordering information to the controller which may, in turn, be linked to the stock control computer in the store.

The above aspects of the invention may advantageously be combined to provide an improved label system. The labels of such a system may be programmed or "commissioned" by the following procedure. The handset is

used to scan a printed product information code on both said product and the printed product information label attended to the electronic label. The information read therefrom is sent via the two-way communication link to the controller which checks the two relate to the same product and, in the absence of any other errors, sends a command to the electronic display to display the required information, e.g. the price (which may be unit price and (product) price).

Thus this provides a reliable and simple way of entering the information for new products/electronic labels while still allowing the updating of displayed information by the controller without use of the handset. Such a system ensures that the controller may monitor all information sent to the electronic labels.

The invention will be further described by way of non-limitative example with reference to the accompanying drawings in which:

Figure 1 shows a schematic representation of an apparatus in which the invention may be used.

Figure 2 shows a holder and the electronic module.

Figure 3 shows components of the electronic module.

Figure 4 shows an electronic label and the fitment thereof in the edge strip.

Figure 5 shows a tool for use in removing the electronic label from the edge strip.

Figure 6 shows a promotional card holder.

Figure 7 shows an electronic label used with a "eurohook".

Figure 8 shows a tool for use in removing the electronic label from the eurohook.

Figure 9 shows a screw type shelf edge label.

Figure 10 shows a first clip type shelf edge label.

Figure 11 shows a second clip type shelf edge label.

The system, as shown diagrammatically in Figure 1, comprises a central controller 100 linked in two-way communication with a number of handsets 102 for use by people stocking shelves and a plurality of electronic labels for displaying product information under control of the central controller. The handsets 102 comprise a reader 104 for reading bar codes on both the product itself and on an additional printed label 11 (e.g. product information and/or promotional label), a keyboard 110 for entering data and a handset display 108 for displaying this data as well as that sent from the controller 100.

The controller 100 may be linked to further store computer systems, e.g. the "system 25" or similar, where each store (of a chain of stores) is linked to a host computer at head office. New price information, ordering information etc can be transmitted between these two computers. In addition each store may have scanning

checkouts, for example DRS Terminals, which automatically give stock information to the store system. It is possible to link the central controller of the present invention to this DRS system by treating it as another checkout terminal. This further allows the handset to be used to enter stock and ordering information.

Referring to Figure 2, each electronic label 1 comprises an electronic module 2 carrying the display and communication electronics and a holder 3 for supporting it and attaching it to the edge of a shelf. The electronic module 2 is shown in more detail in Figure 3 and comprises a PCB 4 including a transceiver circuit, an aerial and a power supply, e.g. an energy storage device (supercapacitor or battery) or a solar cell. The illustrated module 4 is intended for a system where communication is by radio and so for other types of communication such as infrared or inductive loop, the aerial can be replaced by a suitable pick-up such as a photocell or inductive loop. Connected to the PCB is a solar cell 5 for power supply though in an alternative embodiment this can be replaced by a battery such as a long life lithium battery. The module further comprises two light sensors 6, 7 for detection of attached labels as will be discussed later, and also an LCD display 8 for displaying, inter alia, price information. The specific layout of the display may vary, for instance a large, price only display 8a or, as illustrated, a price

and unit price display 8b. The module is housed in a base 9 with a frosted top cover 10a or 10b corresponding to the display used with clear windows to lie over the LCD display(s), sensors and solar cell. This housing 9, 10 is preferably made from plastic and is ultrasonically sealed to ensure that the module 2 is waterproof, self-contained and robust.

The holder 3 of Figure 2 is provided with slots 5 in which a product information label 11 may be fitted. The product information label 11 is a printed label providing details of the product to the customer as well carrying bar codes for use in the system and housing aperture(s) through which the display 8 may be viewed. Once installed, the label 11 activates a first one 6 of the light sensors 6, 7 as an information label sensor. The holder 3 may also comprise a clear cover 12 to protect information label 11 and a finger slot 13 for easy removal thereof. Referring now to Figure 4 also, the holder 3 has on its upper edge near each end a set of small parallel ribs extending longitudinally of the edge, and has on its lower edge, a rubber pad 15. The ends of the top edge of the holder are formed with shoulders 14A and B used in releasing the holder from the shelf as described below. The shelf edge itself is provided with an extended edge strip 16 into which the holder 3 is fitted by inserting the bottom edge to compress the rubber pad 15 and then pushing in the top

edge whereupon the ribs 14 of holder fit into corresponding small recesses 18 in the extrusion. Such an arrangement prevents the holder 3 being removed and the rubber pad 15 further acts to hinder the holder 3 from being slid laterally. The holder 3 may be removed by using a special took 19 as illustrated in Figure 5 and having two tabs 19a and 19b insertable underneath the top edge of the extrusion to engage the shoulders 14A and 14B to lever the holder out by releasing the two interlocking sets of ribs 14, 18. A coloured facia strip 17 may also be slid into the extrusion 16 as illustrated.

At times, such as during a promotion, it may be desirable to fit a larger than usual printed sheet to the holder 3. These promotion cards, or barker cards, 20, as illustrated in Figure 6 are mounted into a promotion card holder 21. The promotion card holder 21 fits around the holder 3 into the extrusion 16 in the same way as the holder 3 and is provided with an aperture 22 through which the display 8 may be viewed. The presence of the card 20 is detected by the other one 7 of the light sensors 6, 7.

The electronic module 2 can also be fitted to other types of display/holders such as the "eurohook" 22 illustrated in Figure 7. As above, the holder 3a is used in conjunction with product information label 11a, promotion card 20a and promotion card holder 21a. The "eurohook" 22 has a modified clip end 23 having an aperture

24 therein. The back of the holder 3a has a sprung pip 25 which when fitted, engages in aperture 24. This prevents the removal of the holder 3a unless, as shown in Figure 8, tool 26 is slid behind the holder 3a to disengage pip 25.

Further holders that can be used include a cellular type for use on special counters e.g. a delicatessen or variants of the shelf edge holder as shown in Figures 9 to 11.

Figure 9 illustrates a holder 3b which holds an electronic module 2 and is provided with two holes 27 through which two screws 28 may engage with a backing plate 29 mounted in the edge strip 16b. The heads of the screws 28 may be of a shape that requires a special tool 19b to screw or unscrew them.

Figure 10 illustrates a holder 3c which holds an electronic module 2 and is provided with two holes 30 for engagement with a backing plate 31 mounted in the edge strip 16c. The backing plate 31 comprises two pairs of clips 32 which are sprung in a direction transverse to the longitudinal axis of the edge strip 16c and can be clipped into the holes 30. Again, a special tool 19c is provided to release the holder 3c.

Figure 11 illustrates a holder 3d which holds an electronic module 2 and which clips onto a backing plate 33. The backing plate comprises two spring clips 34 which clip around the outside of the holder 3d. A special tool

35 is provided to release the holder 3d.

The use and functioning of the system will now be described.

To install a shelf edge label, the electronic module 2 is first snapped into the appropriate holder 3. The product information label 11 is then inserted into the holder 3 covering the light sensor 6. The electronic label 1 is then ready to be programmed and so on the detection of the product information label 11 it sends a message to the controller indicating this fact. A bar code reader 104 attached to a handset 102 is wiped across the bar code (EAN) on the product 112 and then across the bar code on the product information label 11. A confirmation bleep signals when the code is correctly read and the information is transmitted to the controller 100. At this point, the electronic label 1 displays all the LCD segments for a visual check. If all the segments are operating properly then a button is pressed on the handset 102 and a confirmation signal is sent to the controller. The controller 100 checks that the scanned product corresponds to the scanned product information label 11 and sends the price information to the electronic label 1 and the handset which display the price and may be checked by the operator. This allows a check that the correct information has been supplied which is important where two labels might be being programmed at the same time. In an alternative embodiment,

the possibility of confusion can be eliminated by including identifier codes in the signals transmitted between the controller, label and handset. Finally, a reconciliation printout can be obtained from the controller indicating the product lines for which labels have been or have yet to be commissioned.

Price updates can be sent automatically by the store controller 100 to the relevant electronic labels at the beginning of each day.

Often there is a need to change the product description during the life of a product. This means a new product information label 11 will need to be fitted to the electronic label 1. When such a change becomes necessary the electronic label 1 is unlocked from the shelf extrusion 16, thus allowing the old product information label 11 to be removed. This exposes the information label sensor 6 to light, indicating to the electronic module 2 that the product information label 11 has been removed. The LCD display 8 is blanked and the electronic module 2 transmits a signal to the controller 100 confirming this. The new product information label 11 is inserted into the holder 3 and another signal is sent to the main store controller 100 to confirm this. The handset bar code reader 104 is scanned across the EAN number on the product and the bar code on the new product information label 11 and this information is transmitted to the controller. Also an LCD

segment check is made as with the initial label set up procedure. Once the controller 100 has checked with these items, the electronic label is updated. A reconciliation programme can then print out which labels have been updated as well as those which should have been updated.

As mentioned above special offer promotions such as "multibuys", or other promotions may be introduced at times. To install the label for such a promotion first the code on the product information label 11 is scanned using the handset 104. The promotion card 20 or barker card holder 21 is then clipped around the holder 3 and the promotion card 20 is slipped inside the holder 21. The handset reader is wiped across the promotion card 20 bar code and the information is sent to the controller 100. The promotion card sensor 7 on the electronic label 1 senses the presence of the promotion card 20 and transmits this to the controller. Hence the controller may check that the promotion card 20 is in place and that the two codes match up before making any necessary changes. A printout from the store controller can list all the products which have promotion cards 20. Further, the electronic label 1 can alert the controller if the promotion card 20 is removed. Similarly, if a promotion card 20 is placed over an electronic label which should not have one, the controller 100 is informed.

At the end of each trading day, the controller 100

can perform an error printout indicating any malfunctions. These malfunctions could include such things as electronic labels 1 which do not respond to a check, i.e. have failed or been stolen; labels 1 which have lost their product information label 11; labels 1 which should be in store but are not currently programmed; labels 1 which failed the visual check i.e. segment failure on their LCD 8 on installation; incorrect product next to the label 1 highlighted during installation or the manual check (as detailed later); promotion card 20 missing; promotion card 20 on the incorrect label 1.

The system also includes a method by which the displayed price can be manually checked using the handset 102. First, the reader 104 is scanned across the bar code on both the product information label 11 and on the product 112 on the shelf. The price shown on the product information label 11 is then keyed into the handset via the keyboard 110. This information is finally transmitted to the store controller 100 where the reconciliation programme details the results so further action can be taken.

From time to time, it is necessary to decommission labels when products are discontinued and the label is not immediately required for re-use. To achieve this, a decommission option on the handset 102 is selected and the reader 104 is wiped across the product information label 11 bar code. This information is then sent to the controller

100. Next, the product information label 11 is removed from the electronic label 1 and finally, the electronic label 1 is decommissioned by the controller 100 and the LCD display 8 goes blank. A printout may be obtained from the controller 100 to indicate which labels 1 have been decommissioned.

At times, local temporary amendments may be required within a store. Local additional price changes can be entered directly into the store controller 100 (or store computer). Further, 'unexpected stock' local additions require temporary electronic labels to be created at short notice. Information about the line can be entered directly into the controller (or store computer) and a temporary product information label 11 can be made up by writing on a preprinted blank. The label can then be commissioned in the normal way.

CLAIMS:

1. A holder for mounting an electronic display device onto a retail product display, the holder comprising engaging means adapted for engagement with the retail product display in such a manner that the holder may only be disengaged by means of a separate unlocking member.

2. A holder as claimed in claim 1, wherein the engaging means comprises a resilient member mounted on a first edge of the holder and one or more ribs formed on an opposite edge of the holder whereby, in order to mount the holder onto a retail product display in the form of a channel section, shelf-edge strip, the resilient member is located on a wall of the channel and the one or or more ribs are interlocked with one more corresponding grooves provided in the opposite wall of the channel.

3. A holder as claimed in claim 1, wherein the engaging means comprises a sprung pip provided on the back of the holder whereby, in order to mount the holder onto a retail product display in the form of a peg display, the sprung pip engages with an aperture provided in an end portion of the peg display.

4. A holder as claimed in claim 1, wherein the engaging means comprises a backing plate mounted in slots provided in first and second opposing walls of a channel of a shelf-edge retail product display and one or more through holes in said holder through which corresponding screws may be located for engagement with the backing plate.

5. A holder as claimed in claim 1, wherein the engaging means comprises a backing plate mounted in slots provided in first and second opposing walls of a channel of a shelf-edge retail product display, the backing plate having one or more pairs of clips, each pair of clips being sprung in opposing directions to one another; and one or more slots in said holder through which said one or more pairs of clips may be

inserted whereby edges of the clips abut against inner walls of the one or more slots.

6. A holder as claimed in claim 1, wherein the engaging means comprises a backing plate mounted in slots provided in first and second opposing walls of a channel of a shelf-edge retail product display, the backing plate having two opposing sprung clips which engage corresponding end portions of the holder.

7. An electronic label for displaying retail product information comprising an electronic display and one or more sensors for detecting the presence of one or more printed labels mountable on said electronic label.

8. A holder as claimed in any one of claims 1 to 6 for mounting an electronic label according to claim 7, wherein there is further provided slots for receiving a printed label.

9. A holder as claimed in claim 8, wherein the slots are located on the holder such that, when the printed label is positioned within the slots, one of the sensors on the electronic label is obscured.

10. An electronic display system comprising a central controller remotely connected to at least one display module for displaying product and price information having an electronic display.

11. An electronic display system according to claim 10, wherein there is further provided at least one handset for electronically reading printed codes provided on the display module and the central controller is remotely connected by a two-way communication link to the at least one display module and the at least one handset.

12. An electronic display system as claimed in either of claims 10 or 11, wherein the two-way communications link is a radio link.

13. A holder substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

14. An electronic display system substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

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Examiner's report to the Comptroller under Section 17 (The Search Report)

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Relevant Technical fields

(i) UK Cl (Edition K) G5C (CES,CER,CEQ,CBG,CBL,CFA)

(ii) Int Cl (Edition 5) G09F

Search Examiner
P MCLAUGHLIN

Databases (see over)
(i) UK Patent Office

(ii)

Date of Search
16 DECEMBER 1991

Documents considered relevant following a search in respect of claims 1-6,8,9,13

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2183884 A (J M R) See tool 64	1
X	GB 2072398 A (K D R) See use of a magnet, lines 9-15, page 3	1
X	WO 86/07176 (D.) See tool 14	1
X	US 4583309 (M N K) See tool 62	1
X	US 4282667 (G M G) Line 16, column 3	1
X	US 4184277 (J L) See tool A	1

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Category	Identity of document and relevant passages	Relevant to claim(s)

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X: Document indicating lack of novelty or of inventive step.

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